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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Insulating Pouch

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Abstract of The Disclosure

An insulating laminate useful in packaging cooked pizza and other products includes a metallic ply, an intermediate polymeric ply, and a forming web of gas cushion bubbles.

## Insulating Pouch

### Background of The Invention

The present invention relates to packaging materials, and more specifically to a packaging material suitable for making a pouch with insulating and cushioning properties.

Cooked pizza for home delivery and customer pick up is typically placed in a shallow cardboard box with a cover, or an envelope-like pouch for delivery to the customer.

The corrugated box offers very little thermal insulation to keep the pizza warm. The envelope-like pouches are relatively expensive, and therefore the pizza after delivery is typically removed from the pouch, and the pouch returned to the restaurant for further use.

It would therefore be desirable to provide a relatively inexpensive, yet thermally insulative container for the storage and delivery of cooked pizza and other food or non-food items requiring thermal insulation.

It would also be desirable to provide such a container which can be delivered as is, with the contained food product, and left with the customer.

An additional desirable feature of such a container is that it has some mechanical shock resistance, i.e. be able to withstand the abuse created by transportation and delivery

of the contained item, while protecting the products inside the pouch.

The present invention offers a solution to the problem of storage and transportation of food products such as cooked pizza, as well as other food or non-food products that require some thermal insulation and some mechanical shock resistance as well.

Prior Art Statement

U. S. Patent No. 4,576,669 (Caputo) discloses an apparatus and method for producing air-cushioning material in which a first film is heated and thermoformed on a cooled roll with cavities formed therein, and a second film is heated on a heated roll and heat-sealed to the first film.

U. S. Patent No. 4,579,516 (Caputo) discloses a forming roller useful as the cooled roller for thermoforming a first film as described in U. S. Patent No. 4,576,669.

U. S. Patent No. 4,192,699 (Lewicki et al) discloses a method of making inflatable cellular assemblies of plastic material which includes the use of multiple sheets of material.

U. S. Patent No. 4,415,398 (Ottaviano) discloses air cell cushioning dunnage formed from two sheets of flexible plastic material, one of the sheets having been embossed to define cells with entrapped air.

U. S. Patent No. 3,508,992 (Chavannes) discloses a method for making cellular material using multiply laminates with at least one of the laminates embossed prior to sealing the laminates together.

U. S. Patent No. 3,142,599 (Chavannes) discloses a method for making laminated cushioning material, and sealed elements in hemispherical form.

U. S. Patent No. 3,208,898 (Chavannes et al) discloses an embossed, laminated article having an embossed or molded plastic layer, a sealing layer, a plurality of cells, and a second sealing layer sealed to the top of the cells.

U. S. Patent No. 3,285,793 (Chavannes) discloses an embossed cushioning material made by joining two films of plastic together, one of the films being embossed in a hemispherical shape.

U. S. Patent No. 3,586,565 (Fielding) discloses a first sheet sealed to a second embossed sheet to form a plurality of hermetically sealed cells.

U. S. Patent No. 3,616,155 (Chavannes) discloses a cellular product formed of multiply laminates wherein at least one of the laminates is embossed and the other laminate seals the embossment. Each laminate has a plastic base and a gas-impervious coating.

U. S. Patent No. 2,020,639 (Grayson et al) discloses an insulation board having a skeleton structure constituting a system of cells filled with fibrous insulation substance.

Canadian Patent No. 1,191,437 (Ottaviano) discloses a cushioning dunnage material of a first single stratum film, embossed to form air cells therein, and a second film adhered to the first film.

Canadian Patent No. 1 186 204 (Ottaviano) discloses a cushioning dunnage material of a first multilayer film, embossed to form air cells therein, and a second film adhered to the first film.

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Great Britain Patent No. 908,579 discloses a laminated multi-cellular sheet packaging material made by embossing a first web on an embossing drum, and adhering a second web to the first web.

U. S. Patent No. 4,181,548 (Weingarten) discloses a three-layer laminated plastic cushioning material having a flat central layer with sealed air pockets on both sides of the central layer.

U. S. Patent No. 4,855,186 (Grolig et al) discloses a plastic carrier film, a first dielectric layer adhered to the carrier film, and a heat reflection metallic layer adhered to the first dielectric layer.

WO 82/00020 (Nelson-Ashley et al) discloses adhering a linear low density polyethylene film to a sheet metal or foil by engaging the film and sheet metal, heating at least the sheet metal, and applying pressure to the opposed free surfaces. This article may be folded to a pouch.

French Patent Abstract No. FR 2618382-A discloses a packaging material comprising a heat shrinkable plastics material layer adhered to a layer of metallic, preferably aluminum foil. The preferred heat shrinkable layer is polyethylene.

Journal of Applied Polymer Science, Volume 37, No. 5, February 5, 1989, pages 1183-1195 (Hjertberg, Sultan and Sorvik) discloses the effect of corona discharge treatment of ethylene copolymers on their adhesion to aluminum. Ethylene copolymers containing vinyl acetate are examples of polyolefins with increased adhesion properties.

Journal of Applied Polymer Science, Volume 37, No. 5, February 5, 1989, pages 1287-1297 (Hjertberg and Lakso) discloses the effects of different functional groups on adhe-

sion between polyethylene, including ethylene co-vinyl acetate, and aluminum foil.

#### Summary of The Invention

The present invention is an insulating laminate comprising a metallic ply; an intermediate polymeric ply adhered to an inner surface of the metallic ply; and a forming web of gas cushion bubbles adhered to the intermediate ply.

The present invention also encompasses a pouch made from the insulating laminate.

A method of making the insulating laminate comprises the steps of heating a forming web; advancing the heated forming web to an embossing roll; vacuumizing the heated forming web to the embossing roll; vacuumizing the heated forming web to form bubbles in the film; and adhering a laminate of a metallic ply and a polymeric ply to the forming web so that the air in the bubbles of the forming web is trapped between the forming web and the laminate.

#### Brief Description of The Drawings

The invention may be further understood by reference to the drawings, in which:

Fig. 1 shows a top view of an insulating pouch of the present invention;

Fig. 2 shows the pouch of Figure 1 with the flap of the pouch closed;

Fig. 3 shows the pouch of the present invention with part of the top portion of the pouch cut away to show an insert for holding the product to be carried in the pouch;

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Fig. 4 shows a schematic cross section of the inventive laminate; and

Fig. 5 shows a simplified apparatus for a method for producing the inventive laminate.

#### Description of The Preferred Embodiments

Referring to Figure 1, an insulating pouch 10 is made from an insulating laminate 8 (see also Fig. 4) which includes an outer layer 12 of a laminate having an outer metallic ply and an inner polymeric ply. Adhered to this laminate is a formed web 14 of gas cushion bubbles. The insulating laminate 8 has been sealed along a bottom seal 22 and side seal 24, after having been folded along fold line 20, to form pouch 10. A flap 16 extends beyond the mouth of the pouch, and optionally includes a sealing strip 18 for sealing the flap closed after insertion of a food product (not shown) such as pizza.

Figure 2 shows the insulating pouch 10 with the flap 16 in the closed position.

Figure 3 shows the pouch 10 with a part of the top portion of the pouch cut away to reveal an insert 32 which can optionally be used in combination with the insulating pouch 10 to prevent items such as cooked pizza from coming into direct contact with the formed gas cushion bubble web 14 of the pouch.

The metallic ply 12 of the insulating laminate offers thermal insulation for the contained product, and the formed web of gas cushion bubbles 14 offers abuse resistance during storage and handling.

Figure 4 shows a schematic cross-section of a preferred insulating laminate 8 of the present invention.



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Outer laminate 12 includes a metallic ply 13 and an intermediate polymeric ply 15. These plies are preferably adhered together by corona treating the surface of intermediate ply 15 to adhere to metallic ply 13.

Intermediate ply 15 can be monolayer or multilayer in construction, and preferably includes a layer of ethylene vinyl acetate copolymer or other corona treatable material on the surface of ply 15 which will come into contact with metallic ply 13. Various polymeric resins may be used in producing intermediate ply 15, including linear low density polyethylene, polypropylene, polyether block amide copolymer, polyamide, vinylidene chloride copolymer, and chemically modified ethylene copolymers such as chemically modified ethylene vinyl acetate copolymer.

Metallic ply 13 is preferably aluminum, and may be an aluminum foil or sheet of varying thickness, or a non-metallic substrate material to which a metallic layer or coating has been deposited or otherwise adhered. Such metallic ply/polymeric ply laminates are discussed in more detail in copending U. S. Patent Application Serial No. 449,617 which is incorporated herein by reference. The compositions and techniques for producing the laminate of the copending application are suitable in the present application as well.

Forming web 14 may also comprise a monolayer or multilayer construction, and preferably includes a layer of a polyamide such as nylon 6, more preferably a nylon which is adhered by means of intermediate adhesive layers to an outer abuse resistant layer and an inner sealant layer. Ethylene polymers and copolymers are suitable for the construction of forming web 14, and can be ethylene alpha-olefin copolymers also known as linear low density polyethylene and very low density polyethylene.

Figure 5 shows a simplified apparatus and method for producing the insulative laminate of the present inven-

tion. The forming web 14 is advanced from rollers 50 past a connecting roller 52 and a preheat roller 54 to a vacuum roller 56 which is equipped with hemispherically shaped cavities 58 for forming the bubbles of the final laminate. Equipment for this purpose is well known in the art, and is disclosed for example in U. S. Patent Nos. 4,576,669 and 4,579,516.

The density of the bubbles (i.e. number of bubbles per unit area) and the size of the bubbles (i.e. height of the bubbles) can be tailored to the desired end use. For cooked pizza applications, a bubble height of 3/16 inches is preferred, although heights of 1/2 inch or more, or less than 3/16 inches can also be used.

The outer laminate 12 of Figure 4 is advanced from roller 60 and adhered to the forming web 14 after the bubbles have been formed on the forming web. A heated nip roll 62 is selectively pressed against outer laminate 12 as it adheres to forming web 14 in order to assist in the lamination process. The resulting laminate 8 is cooled on cooling roller 64 and can thereafter be further processed (e.g. into pouch 10), or stored for further use.

Optionally, one or more additional plies can be laminated to the forming web 14, outer laminate 12 (along the metallic surface of the metallic ply 13), or both. For example, the forming web 14 may actually be disposed between adjoining layers of a polymeric ply so that in the final pouch, the forming web of gas cushion bubbles will not be an innermost layer of the insulating laminate.

While the present invention has been described by reference to the preferred embodiment, those skilled in the art will understand that modifications such as those just described may be made to the insulating laminate, insulating pouch made from the laminate, and method of making the insu-

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lating laminate without departing from the spirit and scope  
of the claims which follow.

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--THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS--:

1. An insulating laminate comprising:
  - a) a metallic ply;
  - b) an intermediate polymeric ply adhered to an inner surface of the metallic ply; and
  - c) a forming web of gas cushion bubbles adhered to the intermediate ply.
2. The insulating laminate of claim 1 further comprising an additional polymeric ply adhered to an inner surface of the forming web.
3. The insulating laminate of claim 1 further comprising an additional polymeric ply adhered to an outer surface of the metallic ply.
4. The insulating laminate of claim 1 wherein the intermediate polymeric ply comprises a surface layer of ethylene vinyl acetate copolymer.
5. The insulating laminate of claim 1 wherein the intermediate polymeric ply includes a layer of a polymeric material selected from the group consisting of linear low density polyethylene, polypropylene, polyether block amide copolymer, polyamide, saran, and chemically modified ethylene vinyl acetate copolymer.
6. A pouch made from the insulating laminate of claim 1, sealed to itself to form a container.
7. A method of making an insulating laminate comprising:

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- a) heating a forming web;
- b) advancing the heated forming web to an embossing roll;
- c) vacuumizing the heated forming web to the embossing roll;
- d) vacuumizing the heated forming web to form bubbles in the film; and
- e) adhering a laminate of a metallic ply and a polymeric ply to the forming web so that the air in the bubbles of the forming web is trapped between the forming web and the laminate.

8. The method of claim 7 comprising the further step of adhering the metallic ply and the polymeric ply together.

9. The method of claim 8 wherein a surface of the polymeric ply is corona treated, and the treated surface is brought into contact with a surface of the metallic ply.

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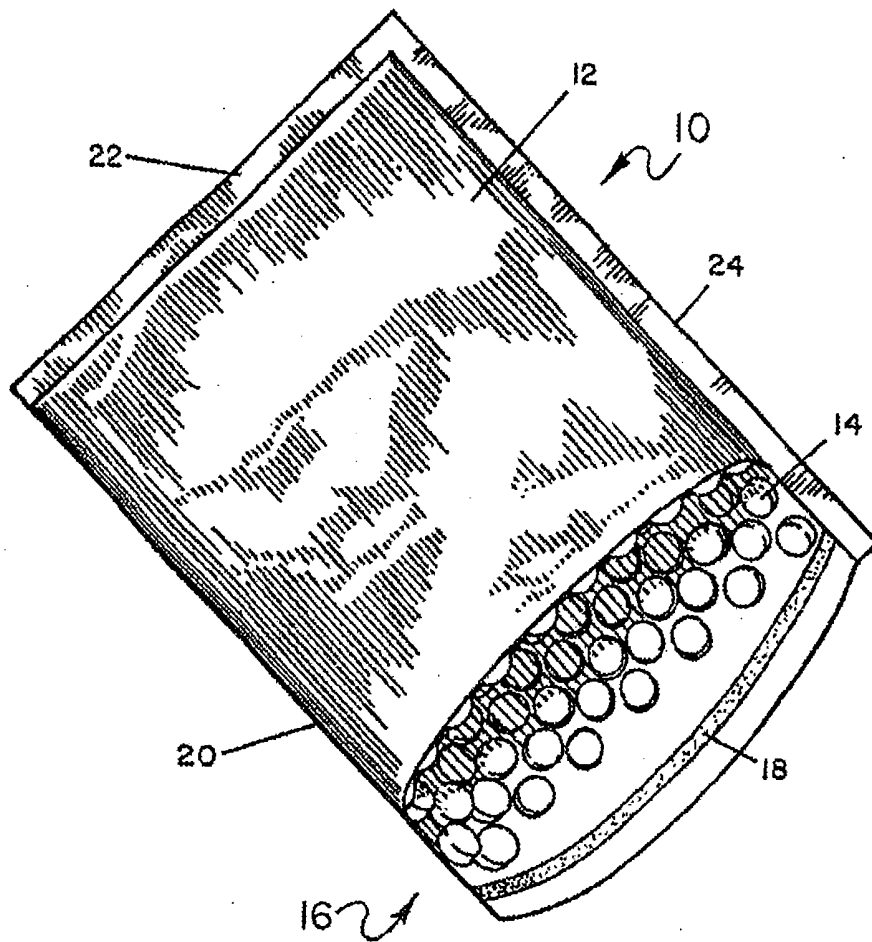


FIG. 1

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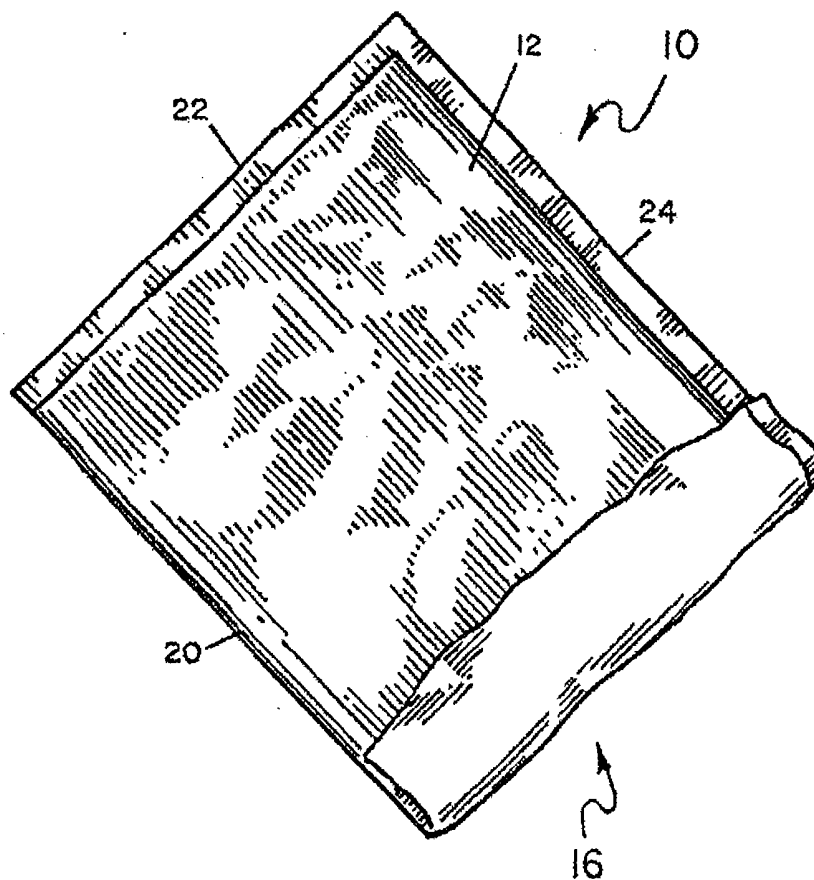


FIG. 2

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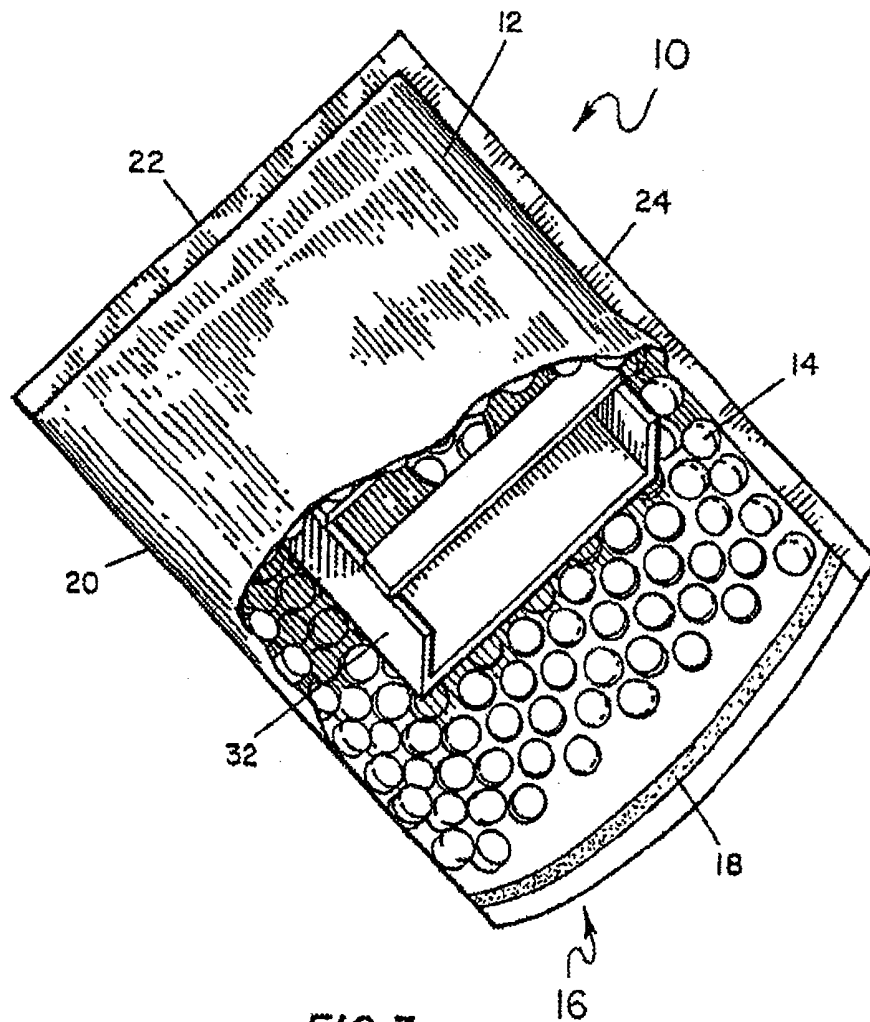


FIG. 3

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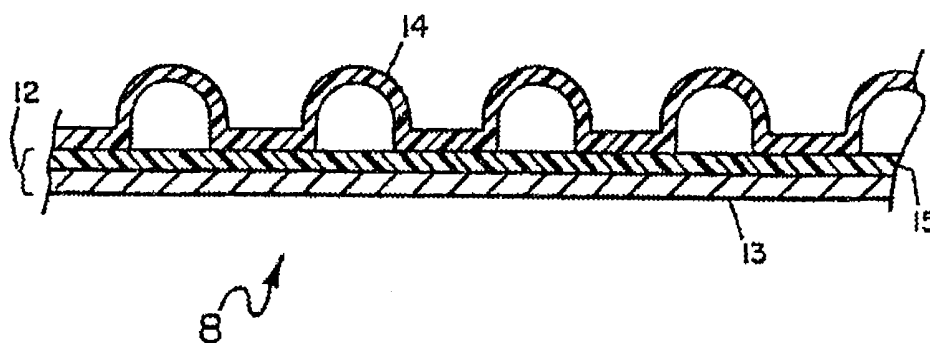


FIG. 4

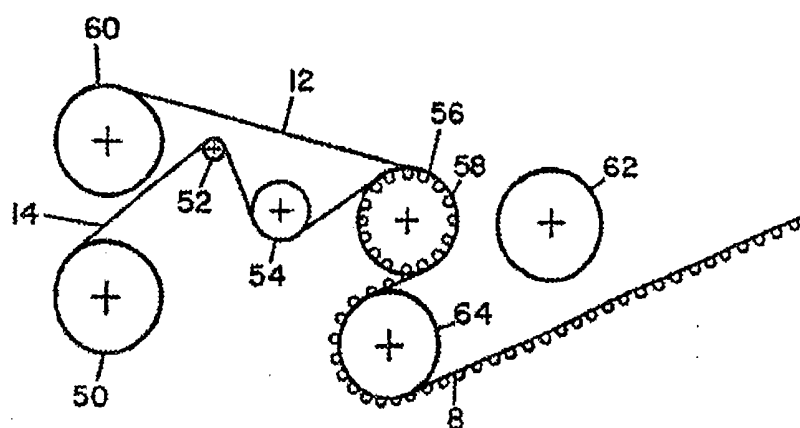


FIG. 5

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